

## BUCKEYE LAKE WHITE BASS

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White bass (*Lepibema chrysops*) made up more than fifteen percent of all fish caught by trap nets over a twelve month period (1939-1940) from Buckeye Lake. Calculations based on catch records from these nets indicate that there were over eighty-eight tons of these fish, beyond their first summer, in the Lake. Since this species made up less than one percent of the catch of anglers (sports or recreation fisherman) it seems wise, at this time of national emergency, to examine its growth, in Buckeye Lake, with reference to use as a supplemental meat food.

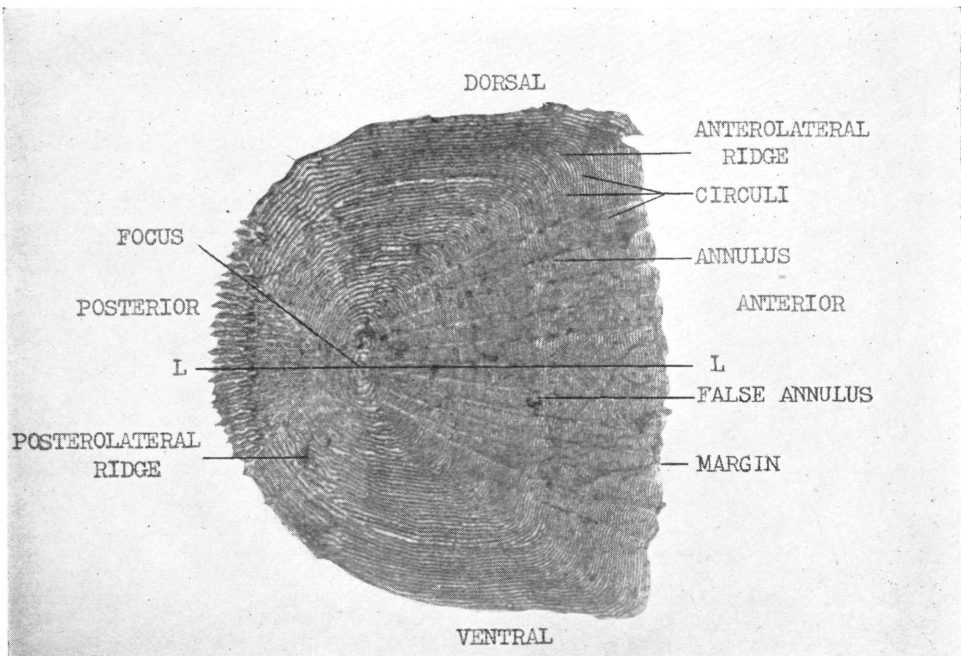


FIG. 1. White bass scale showing the main features, including a true annulus and a false annulus. This scale was taken from a seven-inch fish (total length) on June 17, 1939.

### YEAR CLASSES

In as much as each fish caught by the nets was measured, curves of the length of predominating groups were prepared. These curves were very illuminating. They exhibited three nodes indicating three year classes of fish of a size that could be retained by our nets. Samples of smaller fish were very difficult to obtain by seining because they apparently roam through open water and do not inhabit shallow shores as do most of our other game species. The rapid movement of the

two larger nodes (year classes) to the right during the summer, however, indicated that this species had a fast growth and that there was probably but one year class that was not captured by our nets and that group consisted of the hatch of the year. From September, 1939, on, part of this group was caught by our nets.

Analyses of several hundred scales (taken from the fish as they were caught and measured), considering the annulus formation as indicating one completed year's growth, confirmed the assumption made from length frequencies (Figure 1). Thus Buckeye Lake white bass are primarily a three-year fish with a few hardy individuals living into their fourth summer (or occasionally longer).

Evidence shows that there is a decrease in numbers each successive year, possibly due to the hazards of life such as predators but apparently many of the fish die of old age. Boat livery men, particularly Mr. Bob Donaldson, relate

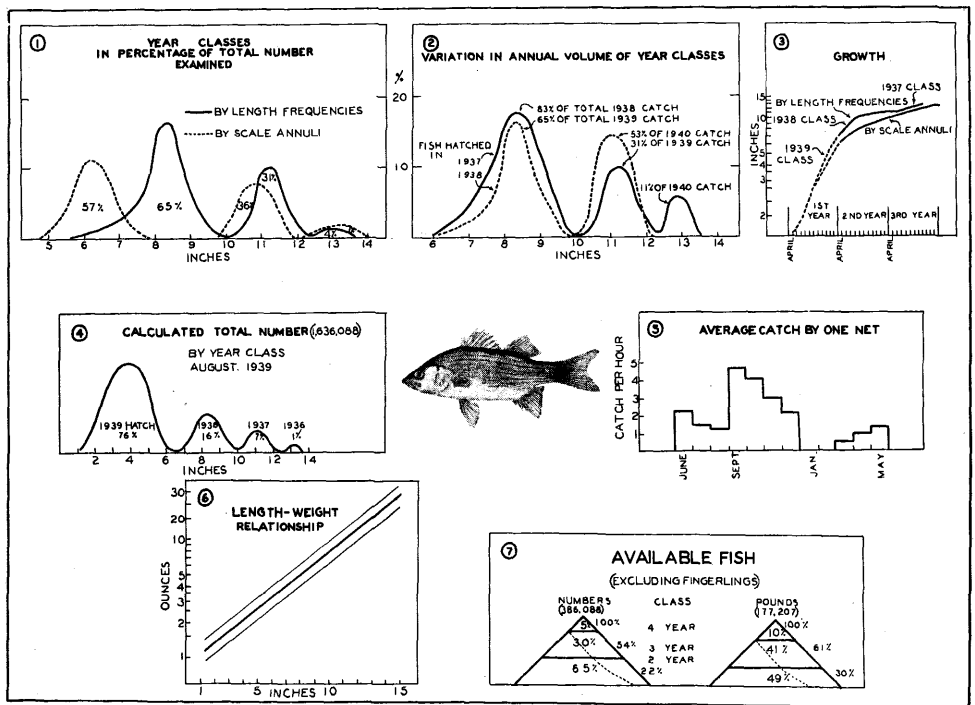


FIG. 2. Growth curves of individuals and distribution of the total white bass population in Buckeye Lake. Details of graphs are referred to in the text.

that weak and dead white bass are seen in the early spring drifting in the waters of the east end of the Lake where they are not normally found, and of course, many of those that die sink to the bottom or are eaten by turtles and other scavengers and are therefore not seen in numbers. We have, then, a species of fish that appears to reach a physiological limit in its life cycle at around its fourth year.

This is an unusual situation in that most species of wildlife are not believed to complete their life span through physiological deterioration, because of the violence of the natural hazards surrounding their every day activities.

This was reported before the American Fisheries Society at Toronto in September, 1940, and briefly mentioned in the Ohio Journal of Science later (Roach, 1942). These data appear with Figure 2 as Graph 1.

## VARIATION IN VOLUME OF YEAR CLASSES

The numbers of white bass in a certain year class may vary somewhat from year to year depending on several factors, particularly success of spawning, availability of food, population pressure, climatic conditions and the size and numbers of other predaceous fish.

Graph 2 portrays this point and shows that fish hatched in 1937 made up 83 percent of the total catch in 1938 (second year class), 31 percent in 1939 (third year class), and 11 percent in 1940 (fourth year class); whereas fish hatched in 1938 made up only 63 percent of the second year class (1939), but 53 percent of the third year class (1940).

## GROWTH

Graph 3 was prepared to show the growth of white bass as calculated from measurements between annuli on the scales and as determined by the length measurements made in the field in 1939 and 1940. The close correlation is striking. One would naturally assume some variations due to yearly food, climatic and population differences, particularly in the smaller fish. This graph indicates that, on an average, white bass reach a length of nearly six inches their first year, nearly ten inches their second year and approach twelve to fourteen inches their third year. The near absence of fish beyond fourteen inches is worth mentioning.

## TOTAL NUMBER

The total number of white bass in Buckeye Lake was calculated from catch and recatch records using the formulae developed by Illinois and Wisconsin fisheries biologists and reported by Schnabel in 1938.<sup>1</sup>

From these calculations there appeared to be 1,636,088 white bass in Buckeye Lake in late July or early August, 1939. Graph 4 shows these in their respective year groups (as calculated in percentages of the second, third and fourth year classes after determining the normal curve of the second year class).

Examination of these data indicates that with 100 young of the year there were 21 yearlings, nine two-year-olds and one three-year-old.

## MOVEMENTS

Fisherman catch many white bass from Buckeye Lake in the early spring when they are apparently spawning or feeding on gizzard shad (*Dorosoma cepedianum*) spawn along the steep sided north bank.

Catch records of our net (set at considerable distance from the north bank) indicate that we missed the major spring movement. However, for the Lake as a whole (Graph 5) the movement of white bass decreased as summer progressed, increased tremendously in the autumn and gradually decreased with the approach of winter. No white bass were taken under the ice sheet which covered the Lake in January and February, 1940.

## AVAILABLE FISH

Graph 7 has been prepared to show the number of white bass present above the fingerling (first summer) stage. With this is another showing the weight of white

$$^1 \quad N = \frac{\sum M_i D_i}{R} \quad \text{or} \quad \frac{\sum M_i T_i}{R}$$

where  $M_i$  = the total number of fish tagged in the lake when fishing  $i$ th time  
 $D_i$  = New fishes caught untagged  $i$ th time  
 $r_i$  = recatches  $i$ th time  
 $T_i$  =  $D_i + r_i$  = total caught  $i$ th time  
 $R$  =  $\sum r_i$ .

bass in each year class (this latter pyramid was prepared by using length weight conversion tables from which graph 6 was constructed). The data are from the same source as Graph 4.

Examination of these pyramids indicates that more than 386,000 white bass weighing 177,000 pounds (nearly 89 tons), all of yearling age or over, were present in Buckeye Lake in late July, 1939.

If trap nets of the same mesh size as our test nets were used to harvest white bass, catch control insuring an adequate surviving brood stock would be comparatively simple. For example, if all the fourth summer fish were removed by these nets and the other year classes were caught in proportion to their numbers in the Lake, 54 percent of the third summer fish and 22 percent of the second summer fish would be taken. This would average a removal of 40 percent of all adult fish from the Lake (53 percent by weight), leaving around 231,000 breeders in the water. This brood stock plus young of the year should be more than adequate to repopulate the Lake by the following fishing season. (Thompson and Bennett, 1938).

If evidence arises to the effect that an overtake occurs and depopulation is imminent, reduction or curtailment of take could be easily made. In any event 46 tons of white bass or any portion thereof should be a worthwhile addition to the central Ohio meat supply.

#### LITERATURE CITED

- Roach, Lee S.** 1942. Fish Population of Buckeye Lake as Determined by Trap Nets. *Ohio Jour. Sci.* 42: 237-245.  
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